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Need for Teachers' Preparation Ahead of the Clamour for Inclusion of Climate Charge in the Education Curriculum

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Abstract
This paper focuses on the need for teachers to prepare for the teaching of climate change since there is a heightened clamour for its inclusion in the education curriculum. This advocacy emanates from the emotional feelings brought about by the devastating effects of climate change-floods, droughts, etc that leads to lost of lives and property. The monstrous posture of the climate change effect and the strength of the advocacy for its inclusion in the education curriculum remains a signal for teachers to commence preparation for the teaching of the subject. The teachers in the primary education level know that they are duty bound to teach all the subjects hence it would be beneficial to them if they start preparing earlier. Some of the preparations include knowledge of climate change related issues and how to mitigate the challenges. Recommendations made include teachers should attend workshops, seminars, conferences; gather of materials; listen to news among other things.
Keywords: Teachers' preparation, clamour, inclusion, climate change, education curriculum.

Introduction

The effect of climate change is alarming. It has led to several problems such as land degradation, ecological disaster, natural disaster, diseases, unusual heat, flood, lost of lives and property etc, due to the magnitude of these effects, people are advocating for the incorporation of climate change into the education curriculum. It could be seen in the light of environmental education which refers to the development of awareness and insight on the part of individual, concerning the resources whether (living or non-living) which make up the earth as a planet. It deals with peoples' relationship with their environment both natural and man-made. It may also be seen as organized efforts to teach about how natural environment functions, and particularly how human beings can manage their behaviour and ecosystems in order to live sustainably. It is a learning process that increases peoples' knowledge and awareness about challenges, to develop the necessary skills to address the challenges and foster attitudes, motivations and commitments to make informed decisions and take responsible action (Designers 2007; Gruenewald 2004 in Gyang 2011).

Since the devastating effect of climate change calls for urgency, it is expedient that teachers prepare to face the task. The purpose of this paper is therefore to highlight the concept of climate change, its causes and effect, the need for climate change education and the great need for teacher preparation considering the degree of advocacy for its inclusion in the education curriculum.

1.1 The Concept of Climate Change

The term climate change is defined in different ways by various experts. According to Uwaegbulam (2013), Intergovernmental panel on Climate Change, IPCC (2007) posits that climate change is "a significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years". By pattern of weather, we mean that the year is normally divided into two - the period when the sun is in the northern hemisphere and the period when it is south of the equator. In temperate regions, where this movement causes wide variation in temperature, the terms 'summer' and winter are used to describe these seasons. But in a tropical land like West Africa the changes are reflected more on the rainfall than on the temperature. It is for this reason that the terms "Wet Season" and "Dry Season" are used to describe the two periods. There are a set of climatic conditions associated with these seasons (Iloeje 1963). The set of climatic conditions associated with the seasons are altered as a result of human activities.

1.2 Causes of Climate Change

Causes of climate change could be attributed to both natural and human activities. On the part of human activities, Oludayo (2004) posits that "it is the response of the earth's climate system to altered concentrations of green house gases". One of the natural causes is volcanic eruptions. Explaining the meaning of volcanic eruption, it is known that rocks below the earth crust have a very high temperature, but the great pressure upon these keeps them in a semi-solid state. If the pressure weakens (as happens when faulting or folding takes place) then some of the rocks become liquid. This liquid is called magma. The magma force its way into cracks of the crust and may either reach the surface where it forms volcano or lava flows or it may collect in the crust where it forms

batholiths, sills and dykes. Magma reaching the surface may do so quietly or with great violence. Whichever happens; it eventually cools and solidifies (Bunnet 1965).

Human acclivities include the emission of carbon dioxide excessively in the atmosphere as a result of gas flaring, burning of coal, large scale industrial activities, chlorofluorocarbons (CFCs) etc. CFCs which do not occur naturally like gases earlier mentioned is a by- product of the chemical industry. CFCs are used in aerosols, refrigeration systems, air conditioning, solvents and foam insulation. Bush burning is also one of the causes of climate change.

1.3 Effects of Climate Change

Climate change impacts on virtually every living thing that exists on planet earth. Aquatic life, plant life, human lives and animal as well economic activities are affected in no small measure. Global warming is one of the effects of climatic change. Global warming is the increasing rise of the global mean temperature above the present value. Global warming is caused by an accumulation of greenhouse gases such as methane, nitrous oxide, carbon dioxide, chlorofluorocarbons and ozone when greenhouse gases allow incoming solar radiation (which heats the earth) to pass through easily, but trap some of that heat which is being radiated back from earth into space, there is greenhouse effect. Chlorofluorocarbons deplete the ozone layer. Ozone layer acts as a protective screen, keeping away harmful ultraviolet radiation from the sun. Ultraviolet radiation leads to an increase in the incidence of skin cancers and cataracts. Beans, peas and certain other crops which are very sensitive to ultraviolet radiation would be adversely affected. Deep penetration of ultraviolet radiation into water (rivers, seas, lakes, ocean, stream) destroys the aquatic life which fish depends on. Agricultural growth and yield would be affected as plant photosynthesis would be inhibited. Moreso, global warming will lead to rise in sea level as ice caps (areas covered by ice) melt. This would eventually cause oceans to expand and become a threat to coastal lands. Due to changes in the contemporary pattern of winds and rainfall, some areas would experience desertification while other areas may experience productive farmland. The world would also experience floods, storms; droughts etc. Besides, diseases like poliomyelitis, cholera, cerebral meningitis, hepatitis B etc would spread. The spread is due mainly to the alteration of the ecosystem of the agents which carry or cause many diseases such as viruses, parasites, bacteria, plants, insects and other animals (Gabriel, Fagbenle and Jaja 1998).

Apart from the above, bush burning which is also an agent of climate change affects the environment through the release of various pollutants found in the bush being burnt. Bush burning increases the encroachment of desert and equally increases global warming due to the emission of gases which have a devastating effect on the ozone layer of the atmosphere. It also leads to the formation of acid rain which deteriorates plant life, damage calcium containing soils and also increases the acidity of surrounding lakes and rivers. One major problem of air pollution is that it affects the respiratory system. Air and entrained pollutants enter the body through the throat and nasal cavities and pass to the lungs through the trachea. The respiratory system can be damaged by both particulate and gaseous pollutants. Apart from the forgoing, in bush burning, excess smoke is spread and the inhailers are exposed to health effects from eye and respiratory tract irritation. This causes serious disorders such as breathing problems, bronchitis, increased severity of asthma, cancer and premature death or cause existing diseases in the heart to deteriorate. Much level of carbon monoxide is poisonous to humans and is capable of causing the breakdown and destruction of the alveolar walls in the lungs. If bush burning is done without caution it could destroy biodiversities, exposure of land to environmental hazards such as erosion, leaching and distortion of the ecosystem (Anonymous 2013).

1.4 The Necessity of Climate Change Education

The realities of climate change are within our finger tips. The effect has made real what used to be regarded as a myth. And because the effect is devastating, there is the need to create awareness among the inhabitants of Nigeria, may the world at large. The awareness creation would be more effective if climate change education is coined and developed.

The pattern of climate as earlier stated is very important in shaping the natural ecosystem and the human economics and culture that depend on them (Mary, 2006). It therefore follows that any alteration in the climate pattern could be disastrous to the living condition of human beings, animals, plants as well as microscopic organisms most of which have economic importance.

Making a step further in the awareness creation of climate change at the global level, the United Nations Climate Science Panel has stated that the president of United States, Barack Obama should spread awareness of the "scientific realities of climate change". Apart from that, the chairman of the intergovernmental Panel on Climate Change, Rajendra Pachauri re-emphasized that one of the president Obama's priorities should be "awareness creation" on the public's understanding of the science underpinning man-made global warming. Consequently, his address remarks thus:

> *...Warning that failing to act on climate change would "betray our children and future generation" he added: same may still deny the overwhelming*

judgment of science, but none can avoid the devastating impact of raging fires, and crippling drought, and more powerful storms.

The chairman, Pachauri further suggests three priorities for the United States to spread awareness of the scientific realities of climate change which include (1) it must make different types of energy, such as coal, properly reflect their impacts on climate and their scarcity by introducing some form of carbon pricing or 'cap in trade', and finally focus quickly on preparing for extreme climate events (Uwaegbulam 2013).

Considering the various alarm raised at different quarters both at international and local levels about the dreadful consequences of climate change, it becomes imperative that climate change be incorporated into the education curriculum at all the levels of education in Nigeria. Education is regarded as one of the agents of socialization and as such integrating climate change in the curriculum would invariably enhance the learners' knowledge of the subject matter. The understanding of the issue at stake should be started from the earliest school age so that the pupils will be conversant with its features and understand how it occurs. According to Igbokwe and Eke (2013), teaching children about climate change shows them how science relates to the real world and about connections between subjects. In addition to nurturing new scientists and engineers, it is also important that through education those of us who are alive now will learn the measures to take in order to mitigate the devastating consequences of climate change".

It takes a well trained teacher to impart relevant skills on climate change adaptability. Therefore, teachers in the Universal Basic Education (UBE) must be trained and retrained for the improvement of their knowledge, disposition, skills, competencies as well as the knowledge or mastery of the curriculum content. Emphasis must be laid on the teacher because it is the teacher that breaks down the curriculum to the level and understanding of the pupils. So the implementation of the curriculum lies squarely in the hands of the teacher. The above is corroborated by Mkpa (2005) as he states that "when curriculum has been designed, it is the teacher who interprets and applies it in the classroom and this important task depends on the intellectual capacity and experiential horizon of the teacher". However, if the teacher must teach climate change, then there is every need or reason for curriculum reforms.

1.5 The Need for Curriculum Reforms

Curriculum can be seen as the outlined programme of learning activities intended to be taught for the development of the learners' cognitive, affective, psychomotor and psycho-productive domains. A more detailed definition has been put forward by Tanner and Tanner (1975) as they defined curriculum as "the planned and guided learning experiences and intended learning outcomes, formulated through the systematic reconstruction of knowledge and experience under the auspices of the school, for the learner's continuous and willful growth in personal-social competence". It is worthy of note that the definition remarks the learner and society in the business of education.

Meanwhile, it could be a reiteration that in as much as society is not static, education would always respond to the societal dynamics. New ideas are always propounded to address various issues. For example the new or contemporary issue of climate change effects must be matched with new ideas to tackle it as much as possible. This is the reason that the curricula in several countries of the globe undergo radical changes.

Gbamanja (1997) posits that radical meaningful curriculum reforms are necessary due to the following reasons:

1) The modern world is changing rapidly: many nations of the world are striving to achieve health for all, wealth for all, education for all etc., but as nations pour in colossal sums of money to achieve these, more impediments compelling deplorable situations emerge. Consequently, the masses of the world seem to becoming poorer, unhealthier and more illiterate. Widespread education through a functional curriculum would help to enlighten the world in it's strive to achieve 'milk and honey' for all.
2) The knowledge explosion in our culture: The current education/ computer technology is introducing overwhelming increase in knowledge in our culture. New curricular designs should, therefore be developed to utilize the technological capacities of devices which can store and retrieve information. Such a technology, with the proper curricula, will enable students to define problems, gather data, suggest hypotheses, generalize intelligently, propose new solutions and reach meaningful scientific conclusions, based on the learner's own research. Such problem-solving skills should be developed in all subject areas through the use of special curricula designs right from the primary school through tertiary education.

From the above reasons for radical curriculum reforms, it becomes imperative that climate change be chosen as a subject or course of study and the subject content be carefully drafted to touch all the salient areas or issues of life that are being affected by the climate change and possible ways of mitigating the effect or prevention strategies.

1.6 Teachers' Preparation: What It Entails

It is the practice in Nigeria that at the primary education level, the teacher assigned to any of the classes teaches all the subjects. Therefore if the clamour for inclusion of climate change into the education curriculum becomes successful, the teacher is duty bound to teach the subject. It is for this reason that the teacher ought to make preparation ahead of time. Such preparation includes training or developing oneself professionally to become an effective teacher. An effective teacher is characterized by the following:

- **Enthusiastic about Knowledge Acquisition:** It is obvious that since society is not static, education is also not static. New ways/methods of solving problems are constantly propounded. The effective teacher always find the slightest opportunity to update his knowledge and skills. He has insight of application of this knowledge that come out daily. He is ready to learn and keeps learning from environment, colleagues, students etc. (Awotua-Efebo 1999; Callahan and Clark in Aminigo and Nwaokugha 2010).
- **Flexible and Open-minded:** The effective teacher is broad- minded and is open to receiving new ideas. He is a reservoir of knowledge and as such has several viewpoints from where he sees things. He develops creative mind hence he is neither fixed nor limited in his ways.
- **Provision of Instructional Materials:** The effective teacher does not go into classroom to teach without instructional material. In the absence of such, he improvises. He does so through the utilization of his intellectual and professional acumen.
- **Devotion to Profession:** According to Awotua-Efebo (1999), teaching is a task that has the potential value of creating a better society through making desirable changes in individuals. The effective teacher has a positive attitude towards professional help". As an experienced teacher, he informs the pupils to avoid dumping refuse in the drainage because of flood incidence.
- **Attendance and Participation in In-service Training:** To prepare as a teacher involves attending seminars, symposia, workshops, conferences. Sandwich and weekend programmes are also to be exploited to achieve ones desire of becoming an effective teacher and readiness to teach climate change as a subject or climate change related topics.
- **Gathering of Materials:** An effective and indeed the would-be climate change teacher should be gathering materials in preparation for the task ahead.
- **Mass Media Friendly:** Listening to news from radio, television, reading newspapers, magazines etc should be his watchword.

Recommendations

Climate change with its attendant negative impacts on the environment is an issue of much concern to all and sundry. While the advocacy for inclusion of climate change into the school curriculum continues to gain ground, teachers should:

- Try to be library friendly;
- Gather books and other materials dealing with climate change;
- Attend workshops, conferences, seminars etc;
- Listen to news from radio, television, journals, periodicals etc;
- The government on their own part should encourage research through improved funding.

Conclusion

The effect of climate change is becoming monstrous owing to its wanton destruction of lives and property. This effect come in the form of flood, excessive heat (global warming), desertification etc. Consequently, the call for inclusion of climate change in the education curriculum is therefore justified. The extent of the advocacy therefore stands as an early signal to primary school teachers to commence preparation for such task since the teachers in primary schools are duty bound to teach all the subjects.

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